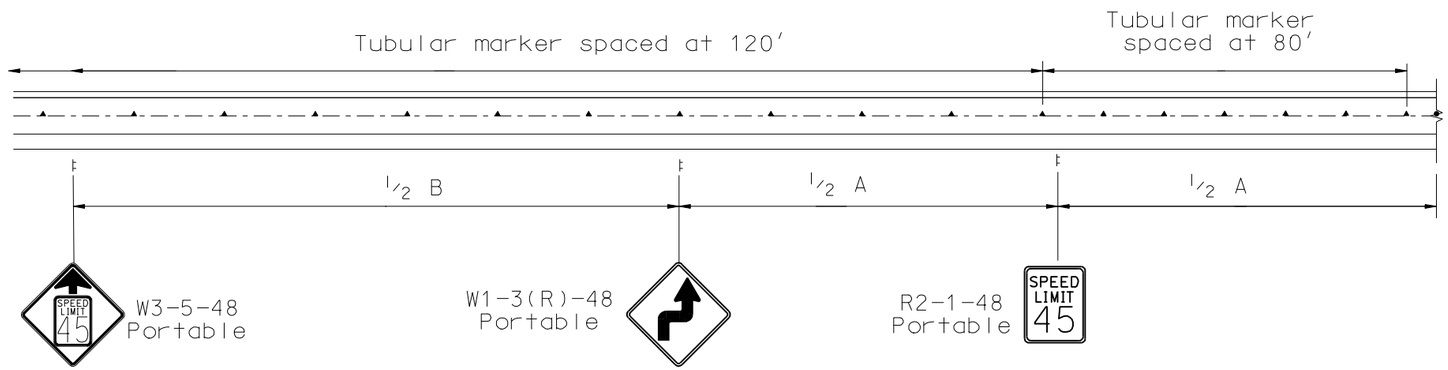
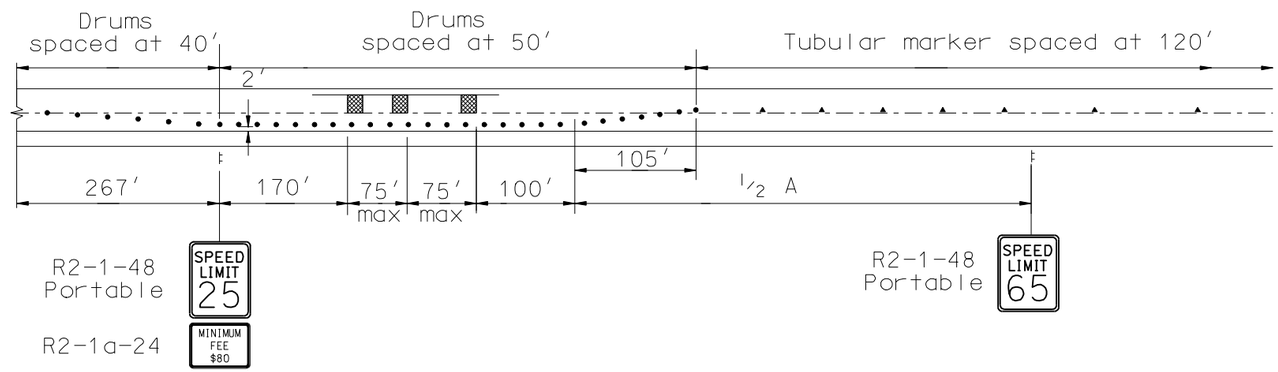
SIGN LAYOUT FOR ONE LANE CLOSURE
MOVING TRAFFIC TO OUTSIDE SHOULDER
FOR CONCRETE JOINT REPAIR INTERSTATE SYSTEM USED WITH D-704-35

D-704-35A





LONGITUDINAL BUFFER SPACE	
*Speed (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
70	585

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

KEY

Type I barricade	Work area
Type II barricade	Flagger
Type III barricade	Sequencing arrow panel
Sign	Type A delineator or vertical panels back to back
Delineator drum	
Tubular markers	

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Notes
1. Advance signs for flagging should be installed when flaggers are flagging.
2. The advanced flagger sign and the speed limit sign are to be moved as the work area moves through the construction zone. When the work area is not visible from the flagger, the flagger station, flagger sign and the 45 mph speed limit sign placed in advance of the flagger sign a distance of ½ A. The 65 mph speed limit sign shall be moved also. Upon completion of the work day, the device shall be moved or covered the next day's run and proceed accordingly. The speed limit 45 mph sign shall be covered or removed during non working hours.
3. APPROACHES: When the work areas encompasses an existing yield or stop sign, approach controlled by installing a 45 mph speed limit sign, a stop sign, and cover the existing yield or stop sign. When the main line 45 mph speed zone is moved past the approach, relocate or remove the approach speed limit sign.
4. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper.
   L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
5. Delineator drums, and tubular markers used for tapering traffic shall be spaced at the dimension "S". Tubular markers used for tangents shall be spaced at 2 times dimension "S".
6. Sequencing Arrow Panels
   Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface.
   Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).
   Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph and 5000 ADT or less).
   Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph and 5000 ADT).
7. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
8. Existing speed limit signs within a reduced speed zone shall be covered.
9. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
10. When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
11. The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 mph. Where speed limits are to be reduced more than 30 mph, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 mph. The second speed limit sign shall be placed at ½ B.
12. The contractor has the option of using portable sign supports in lieu of post mounted sign as shown on the standard drawings as specified in section 704.03 C.
13. During non-working hours, traffic shall be maintained in the driving lane.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

08-06-02

REVISIONS

DATE	CHANGE
07-25-03	Revised R2-1 and R2-1a
10-18-04	Revised R2-1a sign size
12-01-04	PE stamp added
06-29-05	Replaced R2-5a with W3-5, Rev. Adv. Warning Table, Rev Note 11

This document was originally issued and sealed by Mark S Gaydos Registration Number PE-4518, on 06/29/05 and the original document is stored at the North Dakota Department of Transportation